



ON SOME FORMS
OF
EXTEMPORANEOUS CONVEYANCES
FOR
SICK AND WOUNDED
IN
PEACE AND WAR.

*Read before the General Assembly of Members of the
ORDER OF ST. JOHN OF JERUSALEM IN ENGLAND,
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On some Forms of Extemporaneous Conveyances for Sick and Wounded in Peace and War.

THE subject of conveyance for sick and wounded in peace and war is one which concerns all classes and all communities. In referring to history, we find the armies of Greece and other countries were not unmindful of their sick transport, and even among savages it is a well-known fact how wounded are borne away by their comrades by methods peculiar to themselves.

Since about 1792, when Baron Larrey, the eminent French military surgeon, observed the necessity for improved sick transport, it has happily engaged the attention of civilised Governments, philanthropic societies, and even private individuals, and with what great success, the Exhibition at Brussels in 1876 afforded ample proof.

Its importance and efficiency in a military point not alone involves the interest of the sick and wounded, but strategic plans may be promoted or opposed according as the work is done well or ill; and, as has been observed by a distinguished authority, "the tone of moral feeling and degree of confidence among troops, and the preservation of due order in the ranks, are influenced by it." In civil life, in factories, mills, collieries, mines, and other similar works where accidents are not infrequent, confidence is given to those employed, by the establishment of some means of conveyance whereby those who may become injured shall receive immediate surgical aid and attention.

The Ancient Order of St. John of Jerusalem, always prominent in doing good work, and now being desirous of interesting you in the transport of sick and wounded, has honoured me with an invitation to furnish a short paper on my experience on the subject. In accepting it, I felt I might either give you a general review of the forms of regular transport in different countries, or detail some of the more convenient methods for extemporising it. The former, being

varied and complicated, as may be seen by a glance at Professor Longmore's classical and comprehensive work on "Ambulances," I considered it would be impossible to do justice to it in the necessarily limited time placed at my disposal; I have therefore selected for my subject that of "Some Forms of Extemporaneous Conveyances for Sick and Wounded in Peace and War," feeling it would be of more practical utility for those connected with or interested in the humane work of aiding sick or wounded. But, before entering on it, I may mention that each civilised country has its own special regular litters and ambulance waggons, which are suited to its own requirements and exigencies; and in no country is the perfection of means for transporting sick and wounded better exemplified than in England, where our St. John's ambulance wheeled litter, army ambulance waggons, cacolets, and marine transports are second to none for simplicity, comfort, and perfect ease to the sufferers who may be carried by them.

Regular means of transport not being always available, it occurs that such articles as may be found at the scene of an engagement or accident must be utilised, the circumstances and peculiarities of each position determining the forms of the apparatus which may be employed; it is impossible to determine upon any one form, which shall be equally serviceable under all circumstances. How many examples might I not quote, even from late campaigns and expeditions where extemporised transport proved of the greatest service! Take, for instance, the Battle of the Alma, which was fought without a single regular ambulance waggon with our army. The official report on this engagement says, "After the first general action on the banks of the Alma, the want of ambulance conveyance, or any description of vehicle suited for the transport of wounded men, was severely felt." The history of the American War of the Rebellion in 1862 abounds with most interesting accounts of the ingenious contrivances extemporised for the transport of wounded. After some of the engagements in the Franco-German War of 1870-71, where modern weapons of warfare produced such a simultaneous number of wounded, it was impossible, with the usual complement of regular transport, to have the wounded immediately placed in reach of surgical aid. Here, as well as in the evacuation of some of the field hospitals, the ingenuity of our surgeons, on many occasions, was the means

of relieving the disabled by improvising transport. Again, during the expedition to Perak, in the Straits Settlements, in 1876, I am informed several of the wounded had to be carried by most primitive means, and we have only to refer to our illustrated weekly journals, and numerous graphic reports, to observe some of the rough and extemporised methods by which the unfortunate wounded were conveyed during the late Turko-Servian and Russo-Turkish campaigns. All these tend to point out the necessity which exists for an acquaintance with other methods of hospital transport besides that adopted in the regular service of the army.

Extemporised transport may be divided into—(1) means for assisting sick or wounded by supporting them with the hands of bearers or some appliance; (2) the construction of hand litters; (3) the adaptation of general service wagons and country carts, of railway carriages or vans, of river or sea-going vessels, and (4) the construction of horse litters.

1. SUPPORT.—Being one of the most simple means of help, it may be afforded, “when the head, neck, or upper part of the trunk be wounded, by the patient supporting himself by his musket in one hand, used as a walking stick, while his other arm and hand lean upon the upper part of the back and distant shoulder of the attendant who walks by his side. At the same time, the attendant should place his near arm across the back of the wounded man, reaching round and partly encircling his body with the forearm and hand, so as to assist in supporting and keeping erect the upper part of the patient’s trunk.

“The same relative positions of the patient and attendant will answer when the wound has been inflicted in any part of either an upper or lower extremity, after proper temporary protection has been applied to the injured limb. If the wound be in the lower extremity, the patient will be enabled, by such assistance, to walk without throwing the weight of the body upon the foot of the injured side, or may hop along with less exertion and fatigue. If it be in the upper extremity, the patient will not be able to avail himself of any support which requires to be held in the hand; but the injured arm should be slung in a handkerchief, so arranged as to fully support it. Should the patient have to descend a declivity, the attendant should take special care to hold him up as he walks down the slope, not only by encircling the back and chest, but also, at the same time, by supporting the patient’s arms under the armpits. This is necessary, in order to guard against the accident

of the patient suddenly slipping or falling forward from an accession of weakness.”*

If the upper extremities be uninjured as well as the thighs, the patient may be carried on the back of an attendant. In this case the patient places both arms around the neck of the attendant, who supports his thighs. In two instances which came under my own notice, wounded soldiers were rescued from probably lingering if not terrible deaths by this latter means of transport. One was an advanced sentry in front of our trenches before Sevastopol; a comrade, hearing him cry out he was wounded, jumped over the parapet, and, in a few minutes, returned with the wounded man on his back. The other instance occurred during the Indian Mutiny, when one of my brother officers was mortally wounded in the abdomen in attacking a fort near Lucknow. The order was given to retire, but there was no transport near, when one of the men of this officer's company carried him on his back to a place of security. There are several methods by which wounded may be supported by the hands of bearers, that is, by rests or seats made with two, three, and four hands; it is scarcely necessary to give them all in detail, I shall therefore merely mention two or three which will generally suit exigencies.

“If an injured person is able to sit upright, and is able to assist in holding himself up by his own arms, the bearers may then employ all their hands and arms in forming a seat for him; this may be done by the bearers crossing their arms, and then grasping each other's hands; a space is thus left between the bearers' hands and forearms, upon which the patient may be supported for a time with tolerable security.

“He may be carried in a sitting position by two bearers joining two of their hands beneath his thighs, while their arms, which are not thus occupied, are passed round his loins”

An efficient way of removing a wounded man in a sitting position, is by forming a seat known under the name of a “sedan chair,” and it is remarkable how well the weight of a person sitting is borne, when the hands and arms of the bearers are so placed. This arrangement forms a very easy seat for the person so carried, and a very secure one also, if he is in a state to give himself the necessary additional support by placing his arms over the shoulders of the bearers. Mr. Huntington, of the United States Army,

* “A Treatise on Transport of Sick and Wounded Troops.” By Professor T. Longmore, C.B., p. 85.

reports most favourably of this method, as having served a good purpose when he had a wounded soldier carried about three miles who was unable to ride, and it was unsafe to detach a small party to seek the main command.

Seats may be constructed by forming a ring with a handkerchief or leather strap; these, being firmly grasped on either side by the right and left hands of two attendants, form seats, the patient supporting himself with his own hands resting on the attendants' arms or shoulders. An ingenious method of carrying a patient sitting up by means of two bearers and an extemporised seat, may be formed in the following manner:—Two stout sticks, about five feet long, are passed through the inverted sleeves of a great-coat or tunic,* or through a woollen jersey or stout shirt; a seat being thus formed, the patient is placed on it, with his back towards the front bearer, on whom he reclines, while his face is towards the rear bearer, who is thus enabled to closely watch him.

2. THE CONSTRUCTION OF HAND-LITTERS.—A patient may be so severely injured that he is unable to sit up, or the nature of his wounds may be such that it would be most injudicious to attempt moving him in any other than the recumbent position; it will, then, be necessary to consider what form of litter might be constructed from materials available. On the field of battle, the first articles that suggest themselves for forming the sides of stretchers or litters are rifles or cavalry lances. The former may be utilised by being firmly lashed together by their barrels, and then passed through the inverted sleeves of a soldier's great-coat or tunic. Lances, poles, or stout stakes may be used in the same manner, but, when possible, two short pieces should be laid cross-wise at either end to keep the side poles apart.

Knapsacks are capable of being used in the formation of litters, by being fastened with their straps between poles or rifles, and by interlacing the leather belts worn by soldiers, another description of litter may be formed.*

The most common description of an extemporised litter we hear of in civil life is a door, shutter, ladder, and in the hunting field a hurdle or a gate, which, with a blanket, some horse-clothing, a little hay, or straw placed upon them, form ready means of transport for short distances. At railway accidents, the doors of

* Diagrams, representing the method of making litters with coats, knapsacks, and belts, will be found in the "Surgeon's Pocket Book," by Surgeon-Major J. H. Porter, pp. 7, 8, 9, 11, published by Messrs. C. Griffin and Co., London.

carriages and advertising boards have been utilised. With certain injuries, persons have been carried off the field by the body being placed across a saddle-horse, one foot resting in a stirrup-iron, the leather of which had been lengthened.

Blankets may be used by being rolled round rifles or poles, and secured with pieces of cord or of themselves. If not secured, a litter with a patient on it would require four bearers for its conveyance.

Blankets, by having a loop sewn at each corner, can, with two poles or two rifles, make temporary conveyances. A loop should be sewn at each corner, and the blanket then doubled over, so that the two loops at each end are brought together; a pole or rifle can be passed through the four loops on one side, and another within the doubling of the blanket on the other side. If loops have not been previously added to the blanket, a small slit may be made for the same purpose, if the material is sufficiently strong.

“A blanket may also be used by being spread fully out on the ground; the patient should then be laid gently upon it in a suitable direction, and four men, laying hold of the four corners of it, raise it together, and then march with it, as nearly as practicable, in the same manner as if they were bearing a stretcher.” This method is extremely bad, and should never be adopted unless nothing better were available. Mr. Galton, in his excellent work, “The Art of Travel,” recommends a temporary litter, to be constructed in the following manner:—“Cut two stout poles, each eight feet long, to make its two sides, and three cross-bars, of two and a-half feet each, to be lashed to them; then, supporting this ladder-shaped framework over the sick man as he lies in his blanket, knot the blanket well to it, and so carry him off palanquin fashion.”*

General Jackson, of the United States Army, used, in his expedition against the Indians, a bull's hide, suspended between two poles or muskets, upon which the patient was carried by two or four men, as the case might be; and raw hides of cattle found on the roads were utilised on many occasions by medical officers of the American armies.

Oat and corn sacks will serve as a canvas bottom to an improvised litter, or, in an emergency, an old piece of cloth or netting, the fragment of a tent, an outside coat, or even a pair of pantaloons.

* For Diagram, see “Surgeon's Pocket Book,” p. 12.

Boards may be substituted for cloth, in which case a sack, filled with straw, hay, leaves, or other soft material, may be laid across.

Litters may also be improvised by poles being interlaced with ordinary rope, hay rope, or telegraph wire,* something soft being laid on the top. Dr. Appia, of Geneva, suggests that improvised litters may be made by the shirts found in soldiers' knapsacks; poles are to be inserted into each shirt, and a number placed one above the other. There may be some doubt, he says, about the solidity of a litter of this kind, and, before placing a patient upon it, it should be tried, to insure all being in proper order; for nothing can be more distressing than to see a litter break down or bend under the weight of a wounded or suffering man.

Sailors, in the same manner, may utilise their woollen jerseys, blue serge jackets, or "jumpers" (white smock-frocks), oars or boat-hooks being passed through the inverted sleeves for side poles, the stretchers (as suggested by Professor J. D. Macdonald, R.N.) of boats, should such be available, being used for cross pieces.

The canvas awning of a boat will form an excellent bottom for a stretcher, constructed with oars or boat-hooks.

When materials exist for constructing fascines and gabions, litters may be made in the same manner.

In the Report of *Les Ambulances de la Presse* of the Franco-German War of 1870-71, will be found illustrations and descriptions of such litters, which appear simple in construction; and while alluding to materials of this description, I cannot but refer to several ingenious litters designed by Surgeon-Major C. Smith, of the Norwegian Army,† which are made from strong boughs of trees, which have the great advantage of being supported by legs, a most important item in the construction of all litters. One method is by a portion of a bough having at its side a branch strong enough to serve as a leg. It requires four side pieces to make one of these litters, each piece being bevelled at one end with a hatchet or strong knife, and two of them joined together; these are then attached to side poles by cords, osiers, or other material, when the framework of a firm stretcher is constructed, on which may be placed, for its bottom, a piece of canvas. Another method is by having short legs fastened into mortises in the cross pieces, or the cross pieces secured in mortises in the legs, the side poles being attached with cords or osiers.

* For Diagrams, see The "Surgeon's Pocket Book," pp. 8, 10.

† "Nogle nye Transportmidler for Saarede." Af Christen Smith, Médecin Major de l'Armée Norvégienne. Kristiania, 1877.

Hammocks have for a long time been used as a kind of improvised litter, in fact, the old pattern scarlet sash worn by our infantry officers was intended as a means for carrying the owner off the field if wounded; it represents a hammock when pulled out. The woollen scarf worn by the privates in Larrey's Flying Ambulance (*Ambulance Volante*), was similarly used. Except for very short distances, hammocks should not be used without poles, and like blankets without side poles are most dangerous in certain injuries, such as fractures of the lower extremities, and as Professor Longmore well remarks, have nothing to recommend them beyond being less bad than no means of support at all. When, however, suspended on a pole with fixed rigid support, they form comparatively good means of transport. After the battle of Alma a large number of wounded officers and men were conveyed to our shipping in hammocks suspended on poles, a distance of three miles, and in our recent expedition to Ashantee some of the sick and wounded were carried in hammocks and cots arranged with suitable sunshades.

HAND-WHEEL LITTERS of regular form have been designed by Pirogoff, Neudörfer, Neuss, Gablenz, Arrault, Shorthill, and others; but as improvised transport they are difficult of construction, as suitable materials are not likely to be available. Wheelbarrows, Baron Larrey mentions as having been used after the battle of Bautzen in Saxony; two-thirds of the wounded were transported to Dresden, a distance of about thirty miles, by the inhabitants, in a kind of wheel-barrow used in that country for carrying provisions and merchandise.* Our English wheel-barrow may be used for the conveyance of slightly wounded, but in consequence of its construction, and it being necessary to tilt it up when in motion, there would be considerable difficulty in maintaining a patient in even a semi-recumbent position.

Hand-barrows, such as are found at railway stations, and costermongers' hand-carts, may be utilised by having a hair-mattress or bed-case filled with hay or straw, placed on the bottom, care being taken that the patient is prevented from falling off.

3. THE ADAPTATION OF GENERAL SERVICE WAGGONS, AND COUNTRY CARTS, is frequently necessary on active service for the evacuation of wounded men from the field hospitals to base hospitals, indeed, some Governments in a great measure depend

* "Mémoires de Chirurgie Militaire et Campagnes de Baron Lancy, 1817."

upon the aid of such transport. In extensive colliery accidents and other works, carts must necessarily form a large proportion of conveyance for the wounded. The floors should be well covered with straw, hay, small branches of trees evenly placed, ferns, rushes, dried leaves on which the litters conveying wounded in the recumbent position should be placed. If sacks or empty bed-cases are available, they should be utilised and filled with one of the above materials, which would give greater elasticity by keeping it together, and so prevent its displacement from under the body of the patient, which is disposed to occur from the jarring of the conveyance. On the Continent and in India country carts are generally constructed with open sides; with these, one of the litters already described made with belts, rope, hay rope or canvas, may be slung within from the side of the cart, care being taken that the lashings are well secured, but not too tight or too loose. In the former case the litter would receive the impulse from the body of the cart, and in the latter it would knock against its sides. Surgeon-Major Smith has here also added to our list of extemporised wheeled transport a most convenient adaptation of the country cart, by which he has actually contributed springs made from stout boughs of trees. The arrangement consists in one of a rough pole being lashed to the front of the top-side rail of the waggon outside the bars, another is similarly lashed to the rear, this being done at both sides, cross poles are lashed to the free end of the side poles; these cross poles support the litters which are lashed to them. In this manner the wounded in travelling have the advantage of the spring of the longitudinal poles, but to keep within limits bands of osier are placed loosely around them and the top side of the waggon.*

At home our country cart is generally what is known as the "box cart" on two wheels, or the long four-wheel waggon, usually without springs; they can be made comparatively comfortable for short distances by using an ordinary hair-mattress, or filling a sack or empty bed-case with straw or other material, and at great works where accidents are likely to occur, it might be as well to have a few sacks or bed-cases always ready to place on the first available cart, in the event of nothing better being at hand.

* Nogle nye Transportmidler for Saarede af Christen Smith, Médecin Major de l'armée Norvégienne, and Report on the Appliances for Aid to the Sick and Wounded in War. Exhibited in Brussels Exhibition of 1876, by Surgeon-General T. Longmore, C.B.

Spring vans of some kind or another are nearly always to be found in villages, and form most easy conveyance by simply having an ordinary hair-mattress placed on the floor. In New Zealand, where the two-wheeled cart is in common use, Surgeon-Major Manley, V.C., utilised it with advantage. He says, each drag or two-wheeled cart took two wounded. Two hospital bed-cases were filled with fresh fern and placed on them. If the wound was of the upper extremity, or through the chest, more ferns were placed under the bed-case, so as to raise the front half of it, by which means the man could sit in the recumbent position; if of the lower extremities, the other end of the bed was also raised, so as to elevate the legs and thighs above the body. This was found a very good position for amputation of legs or thighs. By these arrangements and the proper distribution of the sick, that is, a slightly wounded man placed alongside one badly wounded, marches of 20 and 25 miles were made with comparative comfort.

In India long and comparatively comfortable journeys have been made by placing a "dhooley" in a country cart filled with fresh straw. The dhooley should be lashed to the side rails of the cart to prevent it toppling over.

Hammocks, I am informed, are frequently used in Australia, suspended in country waggons, which are very long, and by means of uprights at either end secured with strong cords, they are capable of being fully stretched. Medical men being few and far between, it is sometimes necessary to convey the sick or wounded to them over considerable distances. The hammock arranged as above has been found satisfactory as an extemporised conveyance.

THE CONSTRUCTION OF HOSPITAL RAILWAY CARRIAGES AND VANS has of late years interested several Foreign Powers, the dispersion of the disabled being of so much importance, and so easily affected by steam power. Magnificent hospital trains for the transport of sick and wounded have been organised on the Continent and in America, but at home we fortunately have no necessity for this elaboration; it may, however, occur that we are called upon to utilise ordinary railway carriages, vans, or goods' waggons, and improvise some means for transporting sick or injured in them. Mattresses and bed-sacks have been used in America filled with straw and laid on the floor of a waggon, but they were not considered comfortable in consequence of the jarring caused by the vibration of the conveyance, giving rise to grave results in augmenting suffering; this was to a great extent obviated by

first placing a thick bed of fern and straw on the floor beneath the mattress.

A thick layer of loose straw, hay, or leaves has been used, but these were found defective materials for affording elasticity in long distances, as they become rapidly displaced from under the bodies of the patients, accumulating in heaps, and easily broken up and matted. We find, however, that after the battle of Olustee in 1864, where the wounded of the Union side numbered over 1,100 serious cases of compound fracture and of penetrating wounds of cavities, Assistant-Surgeon J. H. Janeway, U.S.A., states they were transported on freight cars bedded with pine boughs, palmetto leaves, and a small allowance of straw, covered with blankets. The train moved slowly, making a journey of nearly 50 miles, and the patients, who had undergone amputation, and others severely injured, complained but little of the rough method of transit.* When straw or other inflammable materials are used, precautions should be taken against fire. The inventions of General Zavo-doosky, of St. Petersburg, for preventing all shock from the motion of goods' waggons were described at the Annual General Meeting of the Order in 1876, and are published in the Report for the year, to which I would invite your attention. In the same Report is a method for adapting our second-class railway carriages for the reception of litters, which is simple, and might be found useful at railway accidents.

The suspension of hammocks in railway vans appears to have been submitted to the Prussian Government in 1859 by Professor Gurlt, of Berlin; but it was found in practice, by his method, that the panels of vans would not sustain the weight of the loaded hammocks, and that the great swaying movement induced vertigo or led to collisions. It was, therefore, not approved of. Since then Dr. Davy, of Westminster Hospital, has been carrying invalids in hammocks suspended in railway vans, and with, I believe, satisfactory results. In trying his method with Messrs. Seydel's twine hammocks on the London and South-Western Railway, I found there was considerable lateral motion or swing, but without any shock or jerk. The motion was not uncomfortable, but it might have at first caused some alarm to a nervous patient. To obviate the difficulties respecting the panels not sustaining the weight, as was found in Professor Gurlt's method, I have introduced tempo-

* "A Report on Plans for Transporting Wounded Soldiers by Railway in Time of War." By. G. A. Otis, U.S.A., p. 8.

rary uprights, from which the hammocks are to be hung by either hooks or cords; and to prevent the swaying motion I place a piece of stick, about two feet long and as thick as a broom-handle, horizontally under each patient's knees, supporting it at either end by cords fastened to the roof and floor, as shown in model and illustration.* With these cords there is little or no swaying motion, and the patient is as comfortable as in a first-class railway carriage. For the transport of our invalids in India I believe the twine hammocks of Seydel would be found invaluable. Slung in a well-ventilated waggon, they would afford coolness, ease, and comfort to the unfortunate sufferers who have to make long journeys under most unfavourable circumstances.

It has suggested itself to me that our ships' hammocks might be utilised were we fighting in a country in which railways were available for conveying our sick or wounded to a port of embarkation. There are two special points to be attended to in using hammocks in railway vans: one is to have them stretched as tight as possible, and the other to place the vans containing them in the centre of the train, so as to have the least amount of lateral motion.

THE ADAPTATION OF STEAMERS, SAILING SHIPS, AND RIVER BOATS as an extemporised means of transport has been found most practicable, affording great ease and comfort to the sick and wounded when properly conducted. During any campaign or expedition in which England has been engaged, water transport was an absolute necessity, and it may be in the recollection of some, that during the Crimean war our marine sick transport was conducted with the most primitive ideas of hygiene. This can scarcely occur again, with the valuable instructions on that subject left us by the late Professor Parkes. In the late American war, when the basis of operations was contiguous to the sea-board, or to the great water-courses, the sick and wounded were removed in steamers, and the hospital transport on the Atlantic and Mississippi and its tributaries formed a large flat. In India, before railways were introduced, country boats were extensively used on navigable rivers, and only recently, during the Turco-Servian war, barges, or river boats, were utilised by Baron Mundy, of the Austrian army, and some of our own agents. Mr. Barrington Kennett, in his report to the National Society for Aid to the Sick and Wounded, speaks

* Model and Illustration have been presented to the Order of St. John, and may be seen at St. John's Gate, Clerkenwell.

most favourably of the manner in which patients were conveyed in barges between Belgrade and other Danube stations. It does not appear necessary in this paper to enter into all the details required in extemporising water transport, as vessels differ so materially in different countries, but when called upon to make use of it, I would suggest the following points being attended to:—Select roomy vessels; treat the sick as far as possible on deck, with suitable protection from weather; when there are two decks, the worst cases should be on the upper one. Arrangements should be made for the separate ventilation of each compartment or deck, for lighting, warming, washing, cooking, disinfecting, supply of pure drinking water, conservancy, and accommodation for the *personnel*.

4. HORSE LITTERS.—The last subject on transport I shall refer to is the construction of horse litters, which may be carried by one or two horses. The one-horse litter is an extemporaneous conveyance, one end of which rests on the ground, the other being secured to a horse or mule, so that the patient is only partially sustained. This is known as the *travee*, or, as some call it, the *travois*.* It has been mentioned by early travellers among North American Indians, and Parkman, in his “History of the Conspiracy of Pontiac and the War of the North American Tribes in 1863,” states that the colonists carried their wounded by this contrivance. In civilised warfare we are not likely to be called upon to make use of such apparently rough transport, but one never knows when circumstances may arise in which a knowledge of its construction may be turned to good account, more especially as we learn from Mr. G. Otis, of Washington, that lately it has received much attention from the Medical Officers of the United States army as being well adapted for the exigencies of frontier service; and Mr. Gibson, of the above army, in remarking on it, says: “The old traditional *travois*, with its rude construction and apparent imperfections, is in reality a great boon. It is open to objection, but when the nature of the service, character of the country, and limited facilities are taken into consideration, the *travois* comes prominently forward, as a means *par excellence*, for the transport of the disabled.” In one campaign, he continues, two cases, that of shot fracture of the thigh and injury of the hip joint, in which its advantages were questionable, were carried a distance of fifty or sixty miles with the utmost comfort, and in their subsequent

* “Report on the Transport of Sick and Wounded by Pack Animals.” By G. A. Otis, U.S.A., p. 20.

transfer to ambulance waggons or to swinging litters in army waggons, their expressed preferences for the *travois* were most pronounced. Another medical gentleman of the same service, in comparing its advantages with that known as the "two-horse litter," which is supported at either end by a horse or mule,* but which is almost too complicated and extensive to be considered under the head of extemporaneous transport, remarks, "The *travois*, on the contrary, is easily constructed, requires but one animal, and only one man to manage it; and should the horse or mule from any reason become unmanageable, the patient has only to roll off, being but a few inches from the ground, and therefore runs very little risk of being injured. The *travois* is very easy of construction, and with a limited supply of tools, finding myself one day several miles in the rear of the column with a sick officer unable to travel on horseback, I succeeded in constructing a very comfortable one in the course of an hour, using small pine trees for poles, and interlacing the lariets of the horses between the poles for the support of the patient. In this case the only tools available were our belt knives.

In conclusion, I would remark that, even with the best description of transport, much injury may be occasioned, and slight wounds formed into grave ones, by unskilled persons attempting to remove the disabled. With a view to avoid such unfortunate results, which, I regret to say, but too often occur, the Order of St. John has instituted a great work, which marks an era in the progress of civilization and humanity, by establishing training classes throughout the country, whereby an element of skilled aid may be diffused and sufferers receive the benefit of proper care and attention.

In our regular army and volunteers a similar movement has been made by Sir William Muir, Director-General of the Army Medical Department, and by Surgeon-General Munro, C.B., President of the Volunteer Ambulance Department, in organising bearer companies, by which the troops, whether in peace or war, shall have the advantage of skilled aid when being moved by regular or extemporaneous conveyances.

* "Report on the Transport of Sick and Wounded by Pack Animals." By G. A. Otis, U.S.A., p. 20.